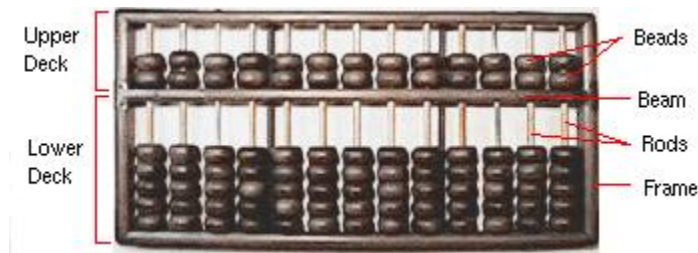


The History of Computers

Abacus

Approximately 4,000 years ago, the Chinese invented the Abacus. It was the first machine used for counting and calculating. It is made of a wooden frame, metal rods, and wooden beads..



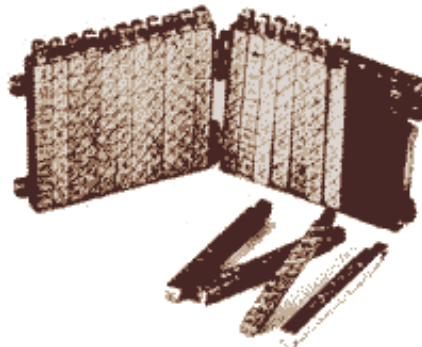
Each bead has a specific value.

Reading from right to left, the beads in the first column are worth 1, in the 2nd column are worth 10, in the 3rd column the beads are worth 100, etc.

Used for addition and subtraction.

John Napier & Napier's Bones

In the early 1600's, John Napier, a Scottish mathematician, invented another calculating tool. It used marked strips of wood or bone, side by side, to multiply and divide. This tool became known as "Napier's Bones."



William Oughtred

In the early 1621, Oughtred inverted the slide ruler to perform direct multiplication and division



Blaise Pascal

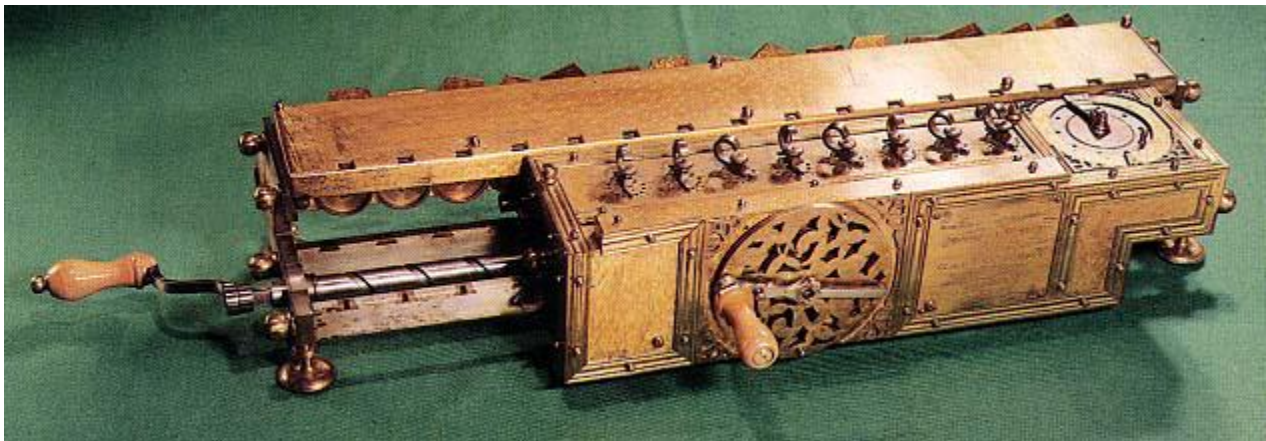
In 1642, at the age of 19, a French mathematician by the name of Blaise Pascal, invented the Pascaline. the Pascaline is known as the first mechanical and automatic calculator. Pascal invented the **Pascaline** to help make his father's job as a tax accountant easier.



Pascal later became famous in math and philosophy, but he is still remembered for his role in computer history. In his honor, there is a computer language named Pascal.

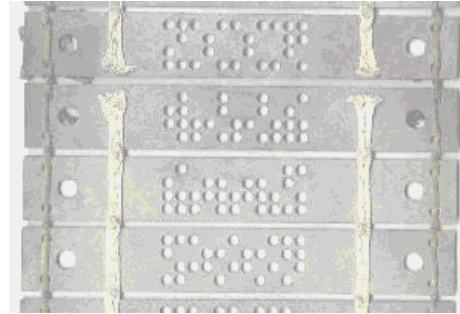
Wilhelm Gottfried Leibniz

In 1673, German inventor Gottfried Leibniz developed Pascal's ideas and invented **The Stepped Reckoner**. This calculating machine was much superior to that of the Pascaline. It could not only add and subtract, but it could also multiply, divide, and find square roots of numbers. It too was mechanical and worked by hand. A crank was added to speed up the work of this calculator. It was used by mathematicians and bookkeepers.

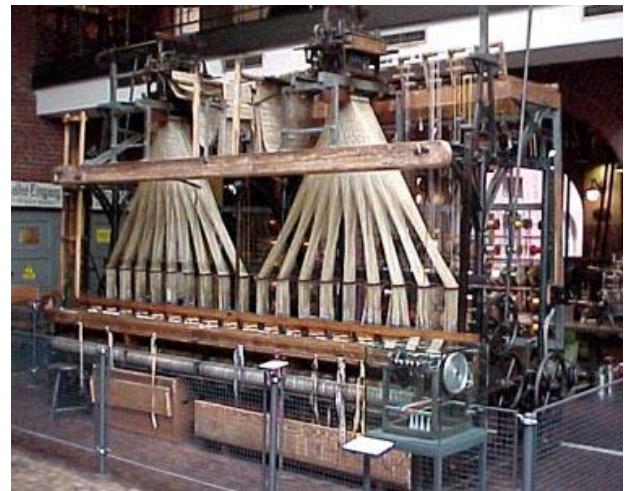


Joseph-Marie Jacquard

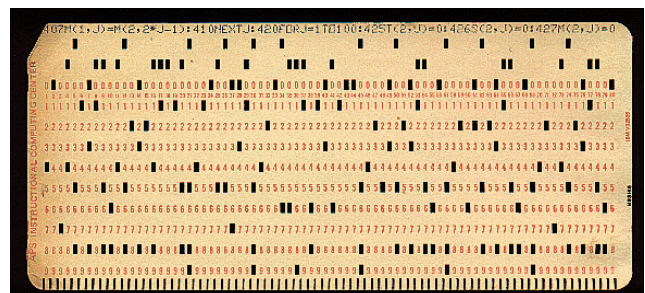
In 1801, Jacquard invented the **Jacquard loom**. It was a weaving machine that was controlled by punched cards. While the loom was being run, cards with holes in them were attached together in a pattern through which strings of thread were automatically fed. These cards would feed the right pieces of thread into the loom to make a cloth.



Weavers today still use the Jacquard Loom.



In the years to follow, variations on Jacquard's punched cards would find a variety of uses, including representing the music to be played by automated pianos and the storing of programs for computers.

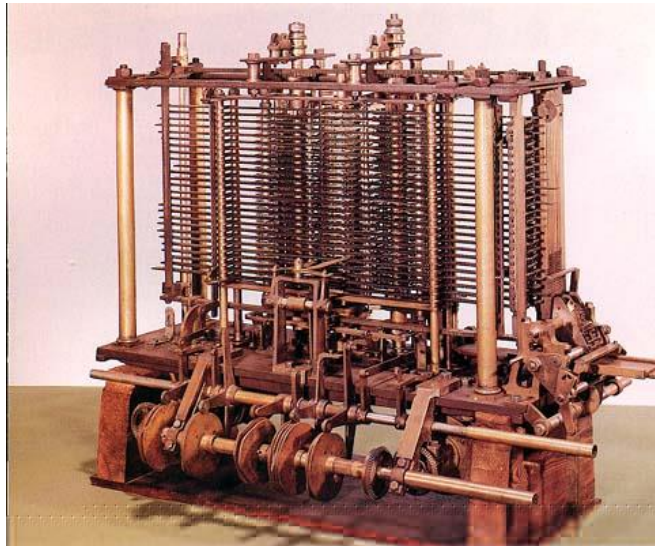


Charles Babbage

In the early 1820s, an English mathematician by the name Charles Babbage, designed a computing machine called the **Difference Engine**. This machine was to be used in the calculating and printing of simple math tables. The machine was never finished.



In the 1830s, he designed a second computing machine called the **Analytical Engine**. This machine was to be used in calculating complicated problems by following a set of instructions on Punched Cards. It would have been the first general purpose computer. This machine was never finished either. This was due to the technology of the time not being advanced enough for his ideas.



George Boole

In 1854, an English mathematician, George Boole, introduces the **Binary** number system and **Boolean** logic. The basis of computer operations.

Herman Hollerith

An American inventor, Herman Hollerith, wanted to speed up the work involved in taking the government census. In 1890, 50 years after Charles Babbage's death, Hollerith invented a machine called the **Tabulating Machine**, using notes that were left by Babbage.



Prior to this invention it took nearly eight years to count everyone in the United States and add up all the information about where people lived, their ages, and what their jobs were. The Tabulating Machine did it in 2.5.

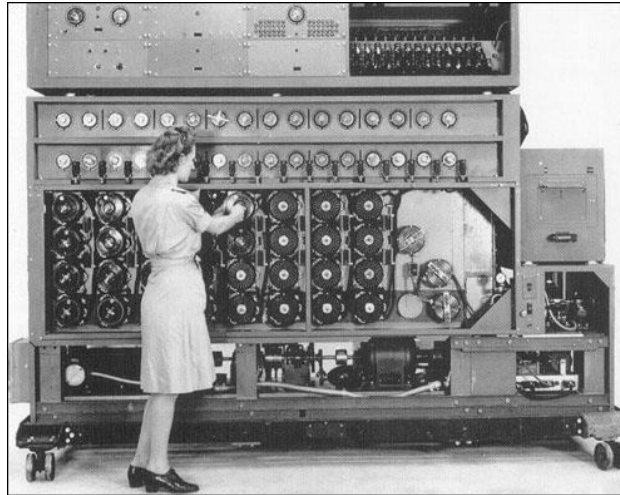
Hollerith started a company and named it the **Tabulating Machine Company**. Eventually this company changed its name to **International Business Machines** or **IBM**.

William Burroughs

In 1886 he developed the first commercially sold adding machine

Alan Turing

In the 1930's Alan Turing conceived the principle of the modern computer. The **Turing Machine**, was a digital computing machine consisting of a limitless memory and a scanner that moves back and forth through the memory.



In 1954, Turing helped develop a machine called **The Colossus**. This machine was used to break the German codes (Enigma) in WWII

John Atanasoff & Clifford Berry

In the early 1940's they built the first electronic-digital computer that used electricity, vacuum tubes, binary numbers and logic systems for computing –

The Atanasoff-Berry Computer



Vannevar Bush

In 1930, Vannevar Bush introduced the first electronic "computer" in the United States, **The Differential Analyzer**. It could measure quantities that changed continuously, such as temperature and air pressure. It used vacuum tubes to switch electrical signals that performed calculations. Bush's machine could do 25 calculations in a few minutes. To show the results, a pen fixed above a drawing board was used to draw a curve on a graph.

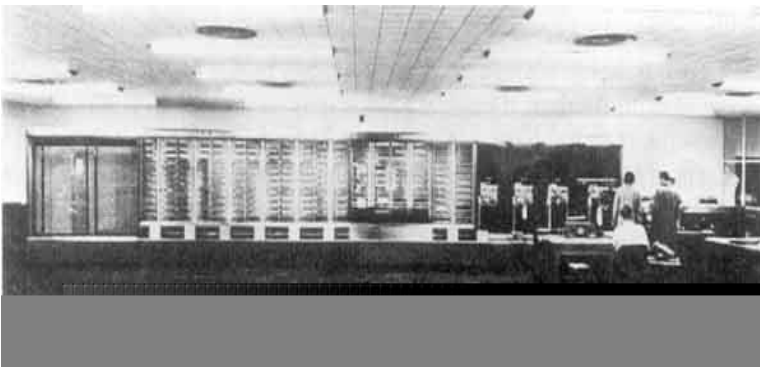


The Differential Analyzer weighed 100 tons, used 2000 vacuum tubes, thousands of relays, 150 motors, and approximately 200 miles of wire.

Howard Aiken

In 1937 Howard Aiken outlined a plan for a machine that could perform math problems involving very large numbers. In 1944, IBM paid engineers to build Aiken's machine.

Called the Mark I, it was made up of 78 adding machines and desk calculators that were connected by almost 500 miles of wires. In one second, the **Mark I** could add three eight-digit numbers; for example, 12,345,678 plus 90,123,456 plus 78,901,234. It could print out its results on punched cards or on an electric typewriter.



The machine 51 feet long and 8 feet high and 3,000 electrical switches. The Mark I was expensive and complicated to build. It had one million parts and weighed approximately 5 tons!

Three versions of this machine were built, Mark I, Mark II and Mark III. A problem with the Mark II found a moth in the machine and dubbed the phrase "computer bug"

Mauchly and Eckert

The first general-purpose electronic computer appeared in 1946. it was developed by John William Mauchly and John Presper Eckert. They called their machine the Electronic Numerical Integrator and Computer (**ENIAC**).



Unlike previous machines, **ENIAC** had no mechanical parts, no counters, and no gears. It relied solely on vacuum tubes. Each vacuum tube contained an electronic circuit, a tiny pathway that carried electricity. Each circuit could turn on and off, much the way a light bulb does.



ENIAC operated 1000 times faster than Mark I. It could do 5000 additions per second and 300 multiplications. The cost of this machine was around 3 million dollars.

However, ENIAC had a number of problems. It's 19,000 vacuum tubes took up so much space that it required a room measuring 20 feet by 40 feet! The tubes also produced a lot of heat and were always burning out. On average, 50 tubes burned out each day.

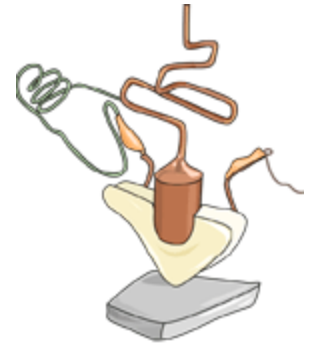
In 1951, Eckert and Mauchly designed another computer called the **UNIVAC** (UNIVersal Automatic Computer). It was the first computer to be sold to businesses. UNIVAC contained 5,400 vacuum tubes and used magnetic tapes to give instructions to the computer.



Brattain, Shockley and Bardeen



In 1947 three scientists, John Bardeen, William Shockley, and Walter Brattain working at AT&T's Bell Labs invented what would replace the vacuum tube forever - **The Transistor**. The transistor was faster, more reliable, smaller, and much cheaper to build than a vacuum tube. One transistor replaced the equivalent of 40 vacuum tubes



Generations of Computers

The First Generation: 1945-1956 (The Vacuum Tube)

Used in the ENIAC, UNIVAC, first generation computers using vacuum tubes were huge, slow, expensive, and often undependable.

Punched Cards for programming were also a breakthrough in this Generation.

The Second Generation: 1956-1963 (The Transistor)

The transistor replaced the vacuum tube and where faster and more reliable. Also introduced in this Generation were programming languages like FORTRAN and COBOL

The Third Generation: 1965-1970 (Integrated Circuits)

The integrated circuit, or as it is sometimes referred to as semiconductor chip, packs a huge number of transistors onto a single wafer of silicon.

Thousands (or today millions) of transistors could be packed onto 1 chip. Since the invention of integrated circuits, the number of transistors that can be placed on a single chip has doubled every two years, shrinking both the size and cost of computers.

Computers could carry out instructions in billionths of a second and the size of these machines dropped to the size of small file cabinets

The Fourth Generation: 1971-Today (The Microprocessor)

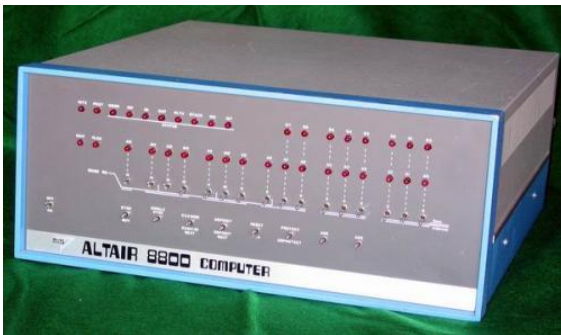
The single biggest advancement in the computer era - the invention of the **Microprocessor** (a single chip that could do all the processing of a full-scale computer)

<p>Assignment : The Future of Computers – find an article(s) that predicts what the future technology of Computers may be and summarize it.</p>
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The History of Microsoft



In December of 1974, two friends, Paul Allen and Bill Gates, developed BASIC – a computer language that could be used to run the Altair 8080 (the World's First Microcomputer Kit). The code for the program was left mostly up to Bill Gates while Paul Allen began working on a way to simulate the code to the hardware.



A deal was struck with the makers of the Altair (MITS) to buy the rights to their BASIC.

Gates was convinced that the software market had been born. Within a year, Bill Gates had dropped out of Harvard and Microsoft was formed.

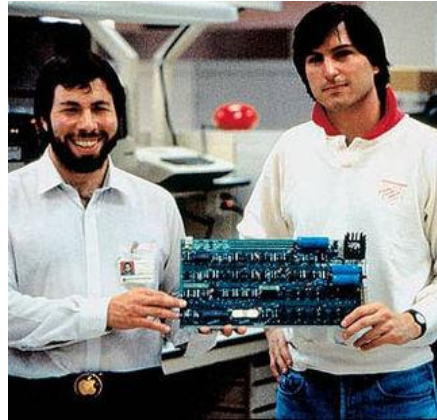
In 1980, Microsoft formed a partnership with **IBM** that allowed them to bundle Microsoft's operating system with IBM computers. The first IBM PC ran on a 4.77 MHz Intel 8088 microprocessor. The PC came equipped with 16 Kb of memory, expandable to 256Kb. The PC came with one or two 160Kb floppy disk drives and an optional color monitor. The price tag started at \$1,565 (about \$4,000 today)



In 1981, MS-DOS (Microsoft-Disk Operating System) was the operating system (written for IBM) that brought the company its real success.

In 1983, **Microsoft Windows** was an operating system with a novel graphical user interface and a multitasking environment for IBM computers. In 1986, the company went public, and Bill Gates became a 31-year old billionaire.

The History of Apple



Steve Jobs and Steve Wozniak were teenagers when the microcomputer was invented. They grew up in Silicon Valley, an area near Palo Alto, California, known for computer and electronic industries. Later they got jobs there as engineers. Being interested in computers, they joined the Homebrew Computer Club and began tinkering with computers.

In 1976, Wozniak, decided to build a small computer that would be easy to use. His friends were impressed with it, and Jobs wanted to market it. The two started their business, Apple Computer, Inc., with the \$1,300 they got by selling Job's Volkswagen bus and Wozniak's scientific calculator.

The first Apple II, named in memory of Jobs's summers spent picking apples in the Northwest, was a huge success. Since then, Apple has made many computers, including the Apple II Plus, Apple IIe, Apple IIc, Apple IIGS, Macintosh, iMac, iPod, and iPhone.